

# BAREBONES PCs

## INTRODUCTION

There are good reasons to build your own PC as opposed to buying one. It's often cheaper, you can pick exactly the parts you want and you might even be able to re-use components from an old computer to save money. However, it can be a daunting task. One alternative to building a PC completely from scratch is to use a barebones PC kit.

This is a case that is supplied ready-fitted with a motherboard and power supply. To finish your PC, you'll need to add a processor, memory, hard disk and optical drive. They're designed to be put together by novices, so you get detailed instructions. They are also smaller than a normal PC, so they take up far less desk or floor space.

This month, we've reviewed eight barebones PC kits. Four are just right for normal home or office work, two would make a good media centre PC and two can be turned into compact gaming PCs. Whatever type of PC you want to build, we'll make it easy.

**Chris Finnamore**

Components and handhelds expert

[chris@computershopper.co.uk](mailto:chris@computershopper.co.uk)



The perfect PC needn't come at a high price. If you have the time and inclination, it can be cheaper and more satisfying to build your own. These eight PCs can be the basis of your dream system, whatever your needs

# BARE ESSENTIALS

## Choosing a... Barebones PC

To help make your choice easier, we've divided the barebones kits in this test into three categories. If you want to build a PC for home or office use, but not for regular 3D gaming, consider the four office barebones kits. They're inexpensive, and perfectly suited to office or internet use. If you want to build a PC to connect to your TV, consider the two media barebones kits. These have many audio and video inputs and outputs, so they're a good choice for connecting to your home entertainment equipment. Finally, if you want to build a small but powerful gaming system, consider the two gaming barebones kits. These have 7.1 surround sound and can accept a powerful PCI Express x16 graphics card.

### KNOW YOUR LIMITS

Barebones PC kits are small and easy to build, but tend to have limited room inside for upgrades. It's vital that you get one with room for all the disks and expansion cards you might want to fit in the future. Most use non-standard motherboards, too, so there's no way to fit a new motherboard if you want to add more features. Make sure that you get all the ports and connectors you need when you buy a kit. We'll warn you when a kit has limited room for disks or expansion

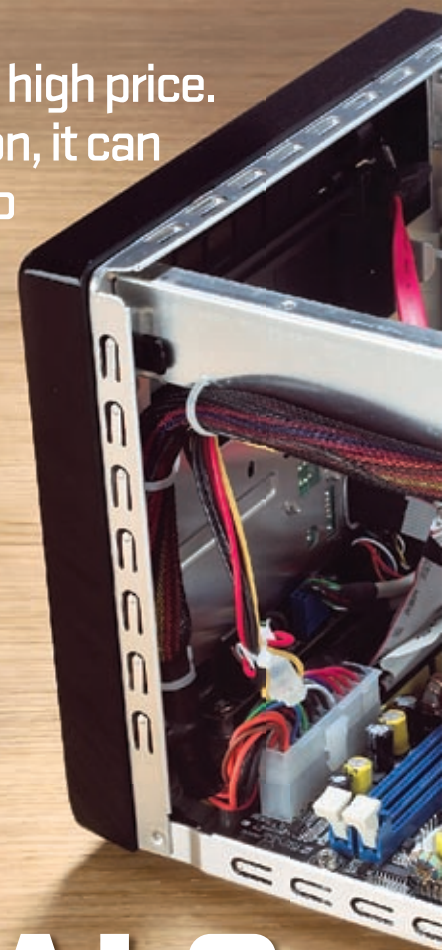
cards, and you can find full specifications for each one in the table on page 114.

The kits in this group each require one of three types of processor. Some use Socket LGA775, which is suitable for Pentium 4, Pentium D, Celeron D and Core 2 Duo processors. Others use Socket AM2, which supports Athlon 64, Athlon 64 X2 and Sempron chips. Finally, two use Socket 479 processors designed for notebook computers. Confusingly, there are two types of socket known as Socket 479. Both the Socket 479 systems here use the newer type, which supports only Core Solo, Core Duo and mobile Core 2 Duo chips.

All the kits have two memory slots and support DDR2 RAM, but the amount of memory and memory speed supported varies. All the kits except Gigabyte's A963-RH use standard desktop DDR2 DIMM modules. The A963-RH uses DDR2 SODIMM modules of the type used in notebook PCs. Three of these kits support a total of 4GB of memory, but the rest are limited to a maximum of 2GB. The table on page 114 shows how much memory is supported by each kit.

### OPTICAL ILLUSIONS

All the kits in this test have an integrated graphics processor. This means that you don't need to spend







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any money on a dedicated graphics card unless you want to play 3D games. Each kit has a D-sub output for connecting to a monitor, and some have DVI connectors that are ideal for connecting an LCD screen. MSI's MEGA mPC is particularly well connected, with both S-video and composite video outputs for connecting to a TV.

If you want to play any 3D games on your new system, you'll need to add a graphics card. Many, but not all, of the PCs in this test have a PCI Express x16 slot for this purpose. However, more powerful PCI Express graphics cards require additional power via a six-pin power connector on the back of the card. None of the kits here has a power supply that includes a suitable connector. To fit a powerful graphics card, you'll need a Molex-to-PCI Express power adaptor, and if you don't have a spare Molex plug you could also require a Molex splitter cable. You can buy both from [www.overclockers.co.uk](http://www.overclockers.co.uk).

With limited space inside, you should consider how many optical drives and hard disks you want to fit inside your new computer. While a normal PC case has room for around four optical drives and four hard disks, no kit in this test can hold more than three hard disks or two optical disc drives. Gigabyte's A963-RH is sold complete with a notebook optical disc drive, but it requires a 2.5in notebook hard disk. The biggest notebook hard disks have a capacity far lower than most desktop disks. All the kits can accept SATA hard disks, but MSI's Axis 945GM

and AOpen's EU965 don't have a spare IDE connector for older IDE hard disks.

### READY TO LAUNCH

All the barebones kits in this review come with step-by-step instructions to help novices build

their PC, but some are clearer than others. Some kits are a cinch to put together, while others can be trickier. Our reviews explain which kits are harder than they should be to assemble. Finally, the only tool you'll need to get started is a cross-head Phillips screwdriver.

## Small pickings The Mini-ITX alternative

The kits in this test make smaller-than-average PCs. However, buying a barebones kit is not the only way to build a small PC. One alternative is to use components designed for the Mini-ITX motherboard standard. Using standard components has advantages; if the motherboard fails, for example, you can just buy another one.

Mini-ITX motherboards measure just 170x170mm and most have a processor already attached. These processors use little power, so it's possible to run a Mini-ITX computer using just 60W. Most barebones kits use around 200W, and desktop PCs use 300W or more. Mini-ITX motherboards use standard memory, and can connect to other standard PC components such as hard disks and optical drives.

The main disadvantage of a Mini-ITX system is its lack of power. The processors are nowhere near as powerful as the latest chips from AMD and Intel. They can run



▲ Mini-ITX are small and ideal for office work

Windows XP and office applications, but some will struggle when playing video and none is suitable for gaming. We'll explain how to build a small, low-power Mini-ITX computer in next month's *PC Builder*.

# OFFICE BAREBONES PCs

## ASUS P2-P5945G

★★★★★  
£123 inc VAT



Asus's P2-P5945G is a slim barebones system that would be suitable for building an office PC. Despite the slim case, it uses a standard desktop processor and there's room inside for two half-height PCI cards, but there's no PCI Express.

This kit is easy to build. The instruction book's black-and-white photos are reasonably clear and the instructions are better written than those of the other products. The manual has some thoughtful touches; it tells you how many screws you need to take out to remove the drive bay, for example, so you know whether it's still screwed in or just stuck. Unfortunately, our kit didn't come with enough screws to mount both the hard disk and optical drive. The optical drive is concealed under a flap at the front, which works well as long as your drive is positioned correctly.

Inside, there's room for just one 5¼in optical drive and one 3½in hard disk, so adding more storage won't be easy. Shuttle's SS21T has room for two of each, and Biostar's 250N allows for three hard disks. However, the P2-P5945G does have an eight-channel surround-sound chip and a DVI output for LCD monitors.

The P2-P5945G performed well in our benchmarks, producing the best overall score of 154. With no graphics card slot, though, it's not suitable for 3D games. It's good value and fast, but we prefer the cheaper Shuttle SS21T, which has more room for expansion.

### SUMMARY

- ✓ Slim; DVI output
- ✓ Fast in Windows applications
- ✗ Room for only one hard disk

**BAREBONES OFFICE PC** LGA775 processor socket, 2x DDR2 533/667 DIMM slots, Intel 82945G Express graphics, no PCI-E x16, 1x SATA port, 10/100/1,000 network, 6x USB2, 1x FireWire, 7.1 audio, 1x 5¼in bay, 1x 3½in bay  
**PART CODE** P2-P5945G  
**SUPPLIER** www.microdirect.co.uk  
**DETAILS** www.asus.com.tw

## BIOSTAR iDEQ 250N

★★★★★  
£117 inc VAT



The iDEQ 250N is one of four cube-shaped barebones PCs in this month's Labs, and the only one that's ideal as the basis of a small office PC. It's inexpensive, and has lots of room for expansion.

The iDEQ isn't especially easy to build, with most problems caused by its confusing instruction manual. The instructions on each page are in several languages, and the black-and-white photos are small and not especially clear. There's plenty of room to work inside the case, but making the optical drive line up with the front of the case isn't easy. Cables block the screw holes once the drive is in place, so adjusting its position is difficult. Instead of a door on the front of the case that automatically opens with the optical drive tray, there's a flap on the front that you must slide down to access the optical drive.

Despite its small size, the iDEQ 250N has space for one IDE and two SATA hard disks. The hard disks can also be arranged in a RAID 0 or 1 array for extra speed or security. The iDEQ 250N was the second-fastest AM2 system in our benchmarks, producing an overall score of 147, and there's room inside for a PCI Express x16 graphics card if you want one.

If Shuttle's SS21T is too big but you want to fit more than one hard disk and PCI Express graphics, the iDEQ is a good buy. It's fiddly to build, though, so if you have the space we recommend the SS21T.

### SUMMARY

- ✓ Good value
- ✓ Loads of room for upgrades
- ✗ Instructions could be clearer

**BAREBONES OFFICE PC** Socket AM2 processor socket, 2x DDR2 533/667/800 DIMM slots, Nvidia GeForce 6100 graphics, 1x PCI-E x16, 2 SATA ports, 10/100 network, 4x USB2, no FireWire, 5.1 audio, 1x 5¼in bay, 3x 3½in bays  
**PART CODE** 58-RIDEQ250N-SPEC1  
**SUPPLIER** www.aria.co.uk  
**DETAILS** www.biostar.com.tw

## MSI Axis 945GM

★★★★★  
£175 inc VAT



The Axis 945GM is one of two barebones systems in the group that use Intel mobile processors. These are more expensive than desktop processors, but produce less heat so there's no need for a large cooler. This is the slimmest office system in the group.

Apart from its processor the Axis uses desktop components, and there is room for up to 4GB of DDR2 RAM in its two memory slots. The manual is clear, and tells you exactly which screws to use for each component. The main difficulty is fitting the processor cooler; once the cooler is sitting on the motherboard, you can't see the screw holes in the board. You have to lower a screw down through the processor cooler and feel for the hole, so a magnetic screwdriver is essential. There's no flap covering the optical drive, so you'll need a black drive fascia for it to match the rest of the case.

Although it's slim, the Axis 945GM has room for two SATA hard disks, but there's no connector for an IDE hard disk. It's one of only four systems in the group with a DVI video output. The Axis 945GM produced an overall score of 150 in our 2D benchmarks, which is identical to Gigabyte's mobile processor-based A963-RH.

The Axis 945GM is well designed with room for expansion, but it's expensive and requires a pricy mobile processor. Asus's P2-P5945G is a better buy if you want a slim case, and Shuttle's SS21T gives you more room for expansion.

### SUMMARY

- ✓ Very slim
- ✓ DVI output
- ✗ Processor cooler is hard to fit

**BAREBONES OFFICE PC** Socket 479 processor socket, 2x DDR2 533/667 DIMM slots, Intel 945GM graphics, no PCI-E x16, 2x SATA ports, 10/100/1,000 network, 6x USB2, no FireWire, 5.1 audio, 1x 5¼in bay, 2x 3½in bays  
**PART CODE** MS-6417  
**SUPPLIER** www.xspo.co.uk  
**DETAILS** www.msicomputer.co.uk

## SHUTTLE SS21T

★★★★★  
£100 inc VAT



Shuttle's SS21T is an unusual system. It's only slightly shorter than a standard PC mini tower and is around the same width. It's a lot

less deep, though, so it'll take up less room on or under your desk. It comes with a fold-out sheet of instructions rather than a full manual. The instructions are easy to follow, and with loads of room inside the case it's easy to build. There's space for two optical drives and two hard disks, and the flaps on the front that cover the optical drives work perfectly. You can fit IDE or SATA hard disks, and you can configure two SATA disks as a RAID 0 or 1 array. Considering the size of the case, it's a shame Shuttle couldn't squeeze in a third hard disk like Biostar's iDEQ 250N. The SS21T is also noisy. It makes about as much noise as a desktop PC when idle.

The SS21T has a basic specification, but it would be well suited as an office PC. Like all the systems here with integrated graphics, it can't play modern 3D games unless you fit a graphics card. When we fitted our standard graphics card in its PCI-E x16 slot, it ran our Call of Duty 2 test at 26fps. This is a little slower than the two gaming systems here. It was marginally the fastest socket-AM2 system in our application benchmarks.

Shuttle's SS21T has room for expansion, is easy to build and good value. It's our Best Buy if you want to build a PC for office or internet use.



### SUMMARY

- ✓ Good value
- ✓ Plenty of room inside the case
- ✗ Quite noisy

**BAREBONES OFFICE PC** Socket AM2 processor socket, 2x DDR2 533/667/800 DIMM slots, SiS Mirage graphics, 1x PCI-E x16, 2x SATA ports, 10/100 network, 6x USB2, no FireWire, 5.1 audio, 2x 5¼in bays, 2x 3½in bays  
**PART CODE** SS21T  
**SUPPLIER** www.ebuyer.com  
**DETAILS** www.shuttle.com



## GIGABYTE A963-RH

★★★★

£249 inc VAT

Gigabyte's A963-RH uses entirely mobile components. This has its problems; notebook components are more expensive than their desktop equivalents and notebook hard disks don't come in capacities larger than 160GB.

However, the A963-RH is by far the smallest system in this group. It's about as big as a hardback book and would look unobtrusive next to your living room TV. It has S-video and optical S/PDIF outputs, so it would be easy to connect to your TV and sound system. Wireless networking isn't built into the chassis, but there's a free mini PCI slot and a dedicated USB port on the front for a wireless USB dongle.

Despite its small size, the A963-RH is easy to build. Its components are all on a tray, which slides completely out from the case, so there's nothing blocking access to the processor socket or memory slots. The notebook hard disk is tricky to fit, though; you'll need small fingers to plug the SATA power and data cables into the rear of the disk once it's screwed into the case. The A963-RH comes with a DVD writer already installed, so you don't have to provide your own.

The A963-RH produced the same overall score in the *Shopper* benchmarks as MSI's Axis 945GM. This score is on a par with the systems that use a desktop processor, and it's quick enough to play and record video. The A963-RH is a compact, quiet and well-specified PC, but it's expensive and not great value.



### SUMMARY

- ✓ Tiny
- ✗ Room for only one hard disk
- ✗ Expensive

**BAREBONES MEDIA CENTRE PC 479**  
processor socket, 2x DDR2 533/667 DIMM slots, Intel 945GM graphics, no PCI-E x16, 1x SATA ports, 10/100 network, 4x USB2, 2x FireWire, 7.1 audio, no 5 1/4in bays, no 3 1/2in bays  
**PART CODE A963-RH**  
**SUPPLIER** www.fastekcomputers.co.uk  
**DETAILS** www.gigabyte.com.tw

## MSI MEGA mPC 51PV

★★★★★

£167 inc VAT



MSI says that the word MEGA in the mPC 51PV's name stands for 'MSI Entertainment and Gaming Appliance'. It sounds daft, but with a TV card in the spare PCI slot it would make a great media centre PC. It has D-sub, DVI, S-video and composite video outputs, so it can connect easily to a TV. It also has an optical S/PDIF output to connect to a surround-sound amplifier and an optical S/PDIF input for recording from a digital source. Its shoebox shape won't fit easily under a TV, but it is small and smart.

The mPC 51PV's manual has step-by-step instructions, but the English translations are occasionally odd and the black-and-white photos could be clearer. Building the PC is easy, though. The inside of the case is tidy, and all the power and data cables are already in place, ready to attach to the optical drive and hard disk. Unless you get the optical drive in exactly the right place, the case's cover catches on its drive tray when it closes.

Once built, the PC is easy to upgrade. The drive bays are on a hinge and swing up out of the way to give you easy access to the expansion slots. There is a PCI slot, a PCI Express x16 slot and a mini-PCI slot for a wireless network card. It performed reasonably well in our benchmarks, coming in just behind the other PCs that use a socket AM2 processor.

It's not as flashy as Gigabyte's A963-RH, but this is a cheap and easy way to make a media centre PC.

### SUMMARY

- ✓ Loads of video outputs
- ✓ Easy to upgrade once built
- ✗ Room for only one hard disk

**BAREBONES MEDIA CENTRE PC AM2**  
processor socket, 2x DDR2 533/667/800 DIMM slots, Nvidia GeForce 6150 graphics, 1x PCI-E x16, 1x SATA ports, 10/100/1,000 network, 6x USB2, 2x FireWire, 7.1 audio, 1x 5 1/4in bays, 1x 3 1/2in bays  
**PART CODE MEGA mPC 51PV**  
**SUPPLIER** www.scan.co.uk  
**DETAILS** www.msicomputer.co.uk

## AOPEN XC Cube EU965

★★★★

£245 inc VAT



AOpen's XC Cube EU965 is the second-most expensive system in the group, but it's also the best looking. The black chassis feels well made. The instructions are mainly detailed, but strangely don't explain how to install the processor cooler. This task is fiddly as the rear screws are obscured by the front-panel cables, which also block access to the PCI Express x1 slot.

The EU965 has two 3 1/2in drive bays and one 5 1/4in bay, and one IDE and three SATA ports. This means you can fit two SATA hard disks and a SATA or IDE optical drive, but you can't fit both an IDE optical drive and IDE hard disk. Lining up the optical drive with the front of the case is fiddly, as you have to make sure the eject button is in just the right place.

When fitted with our GeForce 7800GTX graphics card, the EU965's scores in our 3D benchmarks were marginally the best in the group. It ran Call of Duty 2 at 28.8fps and produced 64.7fps in Doom 3. Its results in our 2D tests were strange, though. Its overall score of 138 is 10 per cent slower than the Socket LGA775 Shuttle XPC SD32G2, but when we ran the tests with a dedicated graphics card installed, the two produced similar scores. There seems to be a problem with the Cube's Intel GMA3000 integrated graphics driver.

The XC Cube EU965 looks great, but it performs inconsistently and is expensive. Shuttle's SD32G2 makes a better gaming PC.

### SUMMARY

- ✓ Looks great
- ✓ Plenty of room inside the case
- ✗ Inconsistent performance; pricey

**BAREBONES GAMING PC LGA775**  
processor socket, 2x DDR2 533/667/800 DIMM slots, Intel GMA3000 graphics, 1x PCI-E x16, 3x SATA ports, 10/100/1,000 network, 4x USB2, 3x FireWire, 7.1 audio, 1x 5 1/4in bays, 2x 3 1/2in bays  
**PART CODE EU96-2Z0**  
**SUPPLIER** www.zomp.net  
**DETAILS** www.aopen.com

## SHUTTLE XPC SD32G2

★★★★★

£200 inc VAT



While most of the systems in this group are black, Shuttle's SD32G2 is silver. It looks smart, but to avoid spoiling its looks you'll need to find an optical drive with a silver bezel.

The instructions are on a fold-out sheet, and are clear and easy to follow. Once you've lifted out the drive cage, there's plenty of room to get at the processor cooler, which is simple to screw into place. There's no door covering the optical drive, which makes the drive easier to fit.

You can fit up to two hard disks alongside the optical drive, one of which can be an IDE hard disk. If you fit two SATA disks, you can set them as a RAID 0 or 1 array. Like AOpen's EU965 it has a Gigabit Ethernet port and 7.1 surround sound, but the SD32G2 has no optical or coaxial S/PDIF outputs.

The SD32G2's scores in our 2D test were impressive; its overall score of 153 was one of the best. When fitted with our GeForce 7800GTX 3D graphics card, it produced 28.8fps in Call of Duty 2 and 64.5fps in Doom 3. These speeds are almost identical to those of the AOpen EU965.

Shuttle's SD32G2 is fast in 2D and 3D applications. It doesn't look quite as good as AOpen's EU965, but it didn't have any problems in our 2D benchmarks. It's also much cheaper and easier to put together. If you're building a mini PC and you want to play 3D games, this is our Best Buy.

### SUMMARY

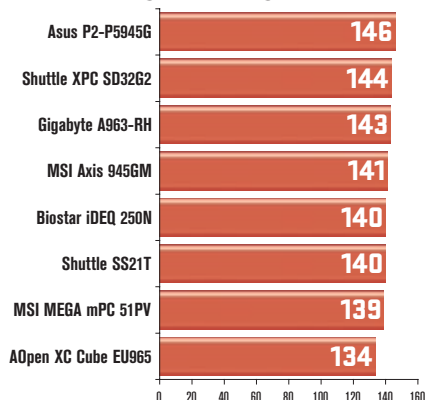
- ✓ Plenty of room inside the case
- ✓ Fast in 2D and 3D
- ✓ Easy to put together

**BAREBONES GAMING PC LGA775**  
processor socket, 2x DDR2 533/667 DIMM slots, Intel 945G graphics, 1x PCI-E x16, 2x SATA ports, 10/100/1,000 network, 6x USB2, 2x FireWire, 7.1 audio, 1x 5 1/4in bays, 2x 3 1/2in bays  
**PART CODE SD32G2**  
**SUPPLIER** www.ebuyer.com  
**DETAILS** www.shuttle.com

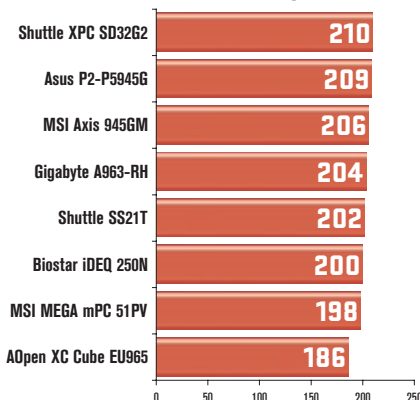
# BENCHMARKS

## 2D Performance Shopper Application Tests

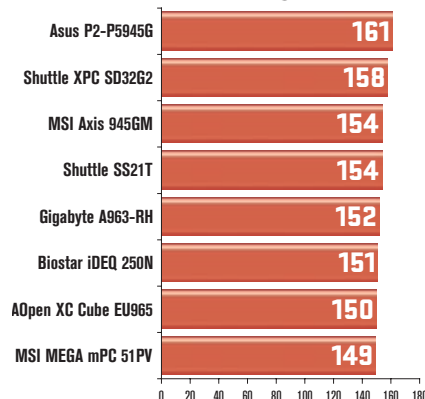
### Image-Editing Test



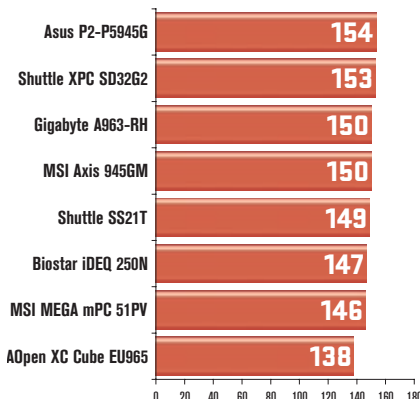
### Video-Encoding Test



### Multitasking



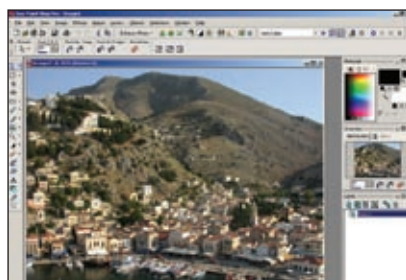
### Overall



Computer Shopper's 2D benchmarks have been designed to show how PCs stand up to the toughest tasks Windows can throw at them. Today's PCs have no problem running office applications such as Word and Excel, so we have chosen to focus our tests on areas where you could experience difficulties.

Encoding a short video to MPEG2 format is a processor-intensive task that anyone transferring home videos to DVD will have to tackle. Our image-editing test simulates a session of photo enhancement using Paint Shop Pro X. In our third test, a set of audio files is ripped to MP3 format.

Finally, we have a multitasking test designed to test the benefits of HyperThreaded and dual-core processors. This test compresses a DVD at the same time as running our

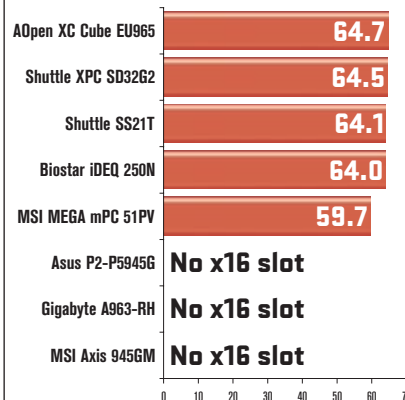


**SETTINGS** We run our application tests at 1,280x1,024 resolution and in 32-bit colour  
**WEB** [www.computershopper.co.uk](http://www.computershopper.co.uk)

image-editing test. Figures are relative to a reference Evesham Athlon 64 3500+, which scores 100 in all tests.

## 3D Performance Games

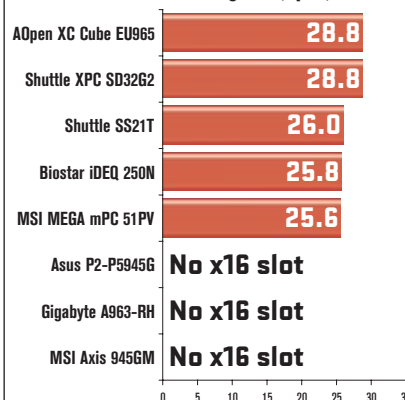
### Doom 3 (fps)



**SETTINGS** 1,280x1,024 resolution, high quality, 4x AA  
**WEB** [www.doom3.com](http://www.doom3.com)

Our Doom 3 benchmark tests whether a PC has the power needed to play cutting-edge 3D games. A good score here indicates that a PC should cope with graphically intense 3D games.

### Call of Duty 2 (fps)



**SETTINGS** 1,280x1,024 resolution, 32-bit colour, default settings  
**WEB** [www.futuremark.com](http://www.futuremark.com)

Call of Duty 2 uses DirectX and is one of the most demanding games available. With a wide range of effects and frenetic action, it tests every aspect of graphics performance.

## How we test Barebones PCs

We built each kit in this test according to the manufacturer's instructions, noting if anything was poorly explained and whether we had any trouble physically fitting components.

To make our test results as consistent as possible, we used similar components in each system. We fitted the Socket AM2 kits with an AMD Athlon X2 4200+ processor, and the Socket LGA775 barebones with an Intel Core

2 Duo E6300. These two processors are similar in price and performance. We fitted each system with 1GB of DDR2 RAM. All the kits that accept a 3½in hard disk were tested with the same 80GB SATA hard disk.

Barebone systems sometimes require noisy high-speed fans to keep them cool, so we noted how loud each one became when idle and while running our 2D benchmarks.

Although none of the integrated graphics chips used in these kits could run our 3D benchmarks, we wanted to see how well they would perform when fitted with a dedicated graphics card. Where possible, we fitted each system with an Nvidia GeForce 7800GTX graphics card before re-running our 3D benchmarks. You can see the results of this second test in the graphs above.

# BAREBONES PCs

| OFFICE PCs                   |                                                |                                                |                                 | BEST BUY                                       | MEDIA PCs                                                  |                                                | GAMING PCs                                            |                                             | BEST BUY |
|------------------------------|------------------------------------------------|------------------------------------------------|---------------------------------|------------------------------------------------|------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------|---------------------------------------------|----------|
| MANUFACTURER                 | ASUS                                           | BIOSTAR                                        | MSI                             | SHUTTLE                                        | GIGABYTE                                                   | MSI                                            | AOPEN                                                 | SHUTTLE                                     |          |
| Model                        | P2-P5945G                                      | IDEQ 250N                                      | Axis 945GM                      | SS21T                                          | A963-RH                                                    | MEGA mPC 51PV                                  | XC Cube EU965                                         | XPC SD32G2                                  |          |
| Rating                       | ★★★★                                           | ★★★★                                           | ★★★                             | ★★★★★                                          | ★★★★                                                       | ★★★★★                                          | ★★★★                                                  | ★★★★★                                       |          |
| Processor socket             | LGA775                                         | Socket AM2                                     | Socket 479                      | Socket AM2                                     | Socket 479                                                 | Socket AM2                                     | LGA775                                                | LGA775                                      |          |
| Processors supported         | Celeron D, Pentium 4, Pentium D, Core 2 Duo    | Sempron, Athlon 64, Athlon 64 X2, Athlon 64 FX | Core Solo, Core Duo, Core 2 Duo | Sempron, Athlon 64, Athlon 64 X2, Athlon 64 FX | Core Solo, Core Duo, Core 2 Duo                            | Sempron, Athlon 64, Athlon 64 X2, Athlon 64 FX | Celeron D, Pentium 4, Pentium D, Core 2 Duo           | Celeron D, Pentium 4, Pentium D, Core 2 Duo |          |
| Processor heatsink supplied  | Yes                                            | Yes                                            | Yes                             | No                                             | Yes                                                        | Yes                                            | Yes                                                   | Yes                                         |          |
| Memory slots                 | 2                                              | 2                                              | 2                               | 2                                              | 2                                                          | 2                                              | 2                                                     | 2                                           |          |
| Memory type                  | DDR2 533/667                                   | DDR2 533/667/800                               | DDR2 533/667                    | DDR2 533/667/800                               | DDR2 533/667 (SODIMM)                                      | DDR2 533/667/800                               | DDR2 533/667/800                                      | DDR2 533/667/800                            |          |
| Maximum memory               | 2GB                                            | 2GB                                            | 4GB                             | 4GB                                            | 2GB                                                        | 2GB                                            | 4GB                                                   | 2GB                                         |          |
| Dual-channel support         | Yes                                            | Yes                                            | Yes                             | Yes                                            | Yes                                                        | Yes                                            | Yes                                                   | Yes                                         |          |
| Motherboard form factor      | Custom                                         | Custom                                         | Custom                          | Custom                                         | Custom                                                     | Custom                                         | Custom                                                | Custom                                      |          |
| Chipset Northbridge          | Intel 945G                                     | Nvidia GeForce 6100                            | Intel 945GM                     | SIS 761GX                                      | Intel 945GT                                                | Nvidia C51PV                                   | Intel G965                                            | Intel 945G                                  |          |
| Chipset Southbridge          | Intel ICH7                                     | Nvidia nForce 410                              | Intel ICH7-M DH                 | SIS 966                                        | Intel ICH7-M DH                                            | Nvidia MCP51                                   | Intel ICH8                                            | Intel ICH7                                  |          |
| Passively cooled Northbridge | Yes                                            | Yes                                            | Yes                             | No                                             | Yes                                                        | Yes                                            | No                                                    | No                                          |          |
| BIOS                         | AMI                                            | Phoenix                                        | Phoenix                         | Phoenix                                        | Gigabyte                                                   | Phoenix                                        | Phoenix                                               | Phoenix                                     |          |
| Integrated graphics (memory) | Intel 82945G Express (128MB shared)            | Nvidia GeForce 6100 (256MB shared)             | Intel 945GM (224MB shared)      | SIS Mirage (64MB shared)                       | Intel 945GM (128MB shared)                                 | Nvidia GeForce 6150 (256MB shared)             | Intel GMA3000 (256MB shared)                          | Intel 945G (224MB shared)                   |          |
| PORTS                        |                                                |                                                |                                 |                                                |                                                            |                                                |                                                       |                                             |          |
| USB2 ports (front/rear)      | 2/4                                            | 2/2                                            | 2/4                             | 2/4                                            | 2/2                                                        | 2/4                                            | 2/2                                                   | 2/4                                         |          |
| FireWire ports (front/rear)  | 1/0                                            | 0/0                                            | 0/0                             | 0/0                                            | 1/1                                                        | 2/0                                            | 2/1                                                   | 1/1                                         |          |
| Legacy ports                 | 2x PS/2, serial                                | 2x PS/2, serial                                | 2x PS/2, 2x serial              | 2x PS/2, serial                                | 2x PS/2, serial, parallel                                  | 2x PS/2                                        | 2x PS/2, serial, parallel                             | 2x PS/2, serial                             |          |
| Graphics outputs             | D-sub, DVI                                     | D-sub                                          | D-sub, DVI                      | D-sub                                          | D-sub, DVI, S-video                                        | D-sub, DVI, S-video, composite                 | D-sub                                                 | D-sub                                       |          |
| Other ports                  | None                                           | None                                           | None                            | None                                           | None                                                       | Optical S/PDIF input                           | None                                                  | None                                        |          |
| INTERNAL EXPANSION           |                                                |                                                |                                 |                                                |                                                            |                                                |                                                       |                                             |          |
| Case size (HxWxD)            | 357x91x275mm                                   | 180x210x355mm                                  | 73x298x371mm                    | 310x188x310mm                                  | 225x62x210mm                                               | 175x210x330mm                                  | 190x200x320mm                                         | 185x200x300mm                               |          |
| PCI                          | 2                                              | 1                                              | 1                               | 1                                              | 0                                                          | 1                                              | 0                                                     | 1                                           |          |
| PCI-E x1                     | 0                                              | 0                                              | 0                               | 0                                              | 0                                                          | 0                                              | 1                                                     | 0                                           |          |
| PCI-E x4                     | 0                                              | 0                                              | 0                               | 0                                              | 0                                                          | 0                                              | 0                                                     | 0                                           |          |
| PCI-E x16                    | 0                                              | 1                                              | 0                               | 1                                              | 0                                                          | 1                                              | 1                                                     | 1                                           |          |
| Dual 3D architecture         | N/A                                            | N/A                                            | N/A                             | N/A                                            | N/A                                                        | N/A                                            | N/A                                                   | N/A                                         |          |
| IDE ports                    | 1                                              | 2                                              | 1                               | 1                                              | 0                                                          | 1                                              | 1                                                     | 1                                           |          |
| Serial ATA ports             | 1                                              | 2                                              | 2                               | 2                                              | 1                                                          | 1                                              | 3                                                     | 2                                           |          |
| Maximum size of RAID arrays  | N/A                                            | 2                                              | N/A                             | 2                                              | N/A                                                        | N/A                                            | N/A                                                   | 2                                           |          |
| Floppy ports                 | 0                                              | 1                                              | 1                               | 1                                              | 0                                                          | 0                                              | 0                                                     | 1                                           |          |
| 3½in drive bays              | 1                                              | 3                                              | 2                               | 2                                              | 0                                                          | 1                                              | 2                                                     | 2                                           |          |
| 5¼in drive bays              | 1                                              | 1                                              | 1                               | 2                                              | 0                                                          | 1                                              | 1                                                     | 1                                           |          |
| Other bays                   | None                                           | None                                           | None                            | None                                           | Notebook hard disk (required) and optical drive (included) | None                                           | None                                                  | None                                        |          |
| FEATURES                     |                                                |                                                |                                 |                                                |                                                            |                                                |                                                       |                                             |          |
| LAN, wireless networking     | 10/100/1,000, none                             | 10/100, none                                   | 10/100/1,000, none              | 10/100, none                                   | 10/100, mini-PCI card slot                                 | 10/100/1,000, mini-PCI card slot               | 10/100/1,000, none                                    | 10/100/1,000, none                          |          |
| Sound (ports)                | SoundMax HD (7.1 line out, optical S/PDIF out) | RealTek AC'97 (5.1 line out)                   | RealTek AC'97 (5.1 line out)    | RealTek AC'97 (5.1 line out)                   | RealTek HD (7.1 line out, optical S/PDIF out)              | RealTek HD (7.1 line out, optical S/PDIF out)  | RealTek HD (7.1 line out, coaxial/optical S/PDIF out) | RealTek HD (7.1 line out)                   |          |
| Surround-sound channels      | 7.1                                            | 5.1                                            | 5.1                             | 5.1                                            | 7.1                                                        | 7.1                                            | 7.1                                                   | 7.1                                         |          |
| Card reader                  | SD, MMC, MS, CF                                | None                                           | None                            | None                                           | SD, MMC, MS, SM, CF                                        | SD, MMC, MS, SM, CF                            | None                                                  | None                                        |          |
| Modem                        | No                                             | No                                             | No                              | No                                             | No                                                         | No                                             | No                                                    | No                                          |          |
| Power supply wattage         | 200W                                           | 220W                                           | 200W                            | 250W                                           | 90W                                                        | 260W                                           | 275W                                                  | 250W                                        |          |
| Cables included              | 1x SATA, 1x IDE                                | 1x SATA, 2x IDE, 1x floppy                     | 2x SATA, 1x IDE, 1x floppy      | 2x SATA, 1x IDE, 1x floppy                     | 1x SATA                                                    | 1x SATA, 1x IDE                                | 1x SATA, 1x IDE                                       | 1x SATA, 1x IDE, 1x floppy                  |          |
| BUYING INFORMATION           |                                                |                                                |                                 |                                                |                                                            |                                                |                                                       |                                             |          |
| Price including VAT          | £123                                           | £117                                           | £175                            | £100                                           | £249                                                       | £167                                           | £245                                                  | £200                                        |          |
| Supplier                     | www.microdirect.co.uk                          | www.aria.co.uk                                 | www.xspo.co.uk                  | www.ebuyer.com                                 | www.fastekcomputer.co.uk                                   | www.scan.co.uk                                 | www.zomp.net                                          | www.ebuyer.com                              |          |
| Details                      | www.asus.com.tw                                | www.biostar.com.tw                             | www.msicomputer.co.uk           | www.shuttle.com                                | www.gigabyte.com.tw                                        | www.msicomputer.co.uk                          | www.aopen.com                                         | www.shuttle.com                             |          |

## Labs verdict Barebones PCs

Our last Labs review of barebones PCs in *Shopper* April 2006 left us with shredded fingers from building the systems and a ringing in our ears from the racket made by their fans. This time around, we were glad to find that most systems were easy to build and fairly quiet. Whatever you want to use your new PC for, there's a kit here that'll be ideal.

If you need a small PC for home or office work, Shuttle's SS21T is the one to pick. It's

great value, easy to build and has plenty of room inside for expansion. It wins our Best Buy award. If you want a small, quiet PC to run next to your television, we recommend MSI's MEGA mPC 51PV. It's good value and has all the necessary video outputs. Gigabyte's A963-RH is a tempting alternative, but it's expensive to buy and build.

If you want to build a small but fast PC with a dedicated graphics card for gaming, Shuttle's SD32G2 is the best choice. It looks

### OFFICE BAREBONES PC

**SHUTTLE SS21T**  
★★★★★

### GAMING BAREBONES PC

**SHUTTLE XPC SD32G2**  
★★★★★

good, is easy to build and is fast in both 2D and 3D applications. It's our Best Buy if you want to build a gaming system.